CSC 7700
Virtualization
Fall 2007
Syllabus
Gerald Baumgartner

Course Summary
We will study a wide range of virtualization techniques and systems, from the Java VM to VMWare to my research projects on a virtual embedded systems testbed and the Organic Grid. We will examine compiler techniques, low-level operating system techniques, as well as the architecture support for virtualization in current processors.

Prerequisites
The equivalent of either
- CSC 4101: Programming Languages.
- CSC 4103: Operating Systems.

Office Hours

<table>
<thead>
<tr>
<th>Who</th>
<th>Where</th>
<th>Phone</th>
<th>E-Mail</th>
<th>When</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gerald Baumgartner</td>
<td>Coates 290</td>
<td>578–2191</td>
<td>gb</td>
<td>W 1:30–3:30pm</td>
</tr>
</tbody>
</table>

Other office hours by appointment (recommended).

Reading
There is no textbook! This is an experimental research course. We will primarily use material from research papers and product literature.

- Course material for *EECS 441 — Resource Virtualization* at Northwestern.
- Mailing list.
Important Dates

- Labor Day: Sep. 3
- Fall Holiday: Oct. 11–12
- LCPC: Oct. 11–13
- OOPSLA: Oct. 23–25

There will be no exams.

Assignments

This course is designed as a research course. The project you will work on this semester will be a miniature version of a Ph.D. project. As such, the exact number and type of assignments may vary with the project you choose to work on. Typically, there will be

- An annotated bibliography.
- Two short presentations of papers from the literature.
- A project proposal.
- A project of your choice.
- A paper about your project.
- Reviews of the final papers of three classmates.
- A presentation at a mini conference.

Grading

Because the scope and nature of the projects is expected to vary, it is not possible to determine a precise grading scale. The majority of the grade will depend on the project. For the assignments outlined above, the grading might be as follows:

<table>
<thead>
<tr>
<th>Assignment</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bibliography</td>
<td>20%</td>
</tr>
<tr>
<td>Paper presentations</td>
<td>10%</td>
</tr>
<tr>
<td>Project Proposal</td>
<td>10%</td>
</tr>
<tr>
<td>Project and Paper</td>
<td>40%</td>
</tr>
<tr>
<td>Reviews</td>
<td>10%</td>
</tr>
<tr>
<td>Presentation</td>
<td>10%</td>
</tr>
</tbody>
</table>

Topics

The topics we will cover will depend on how fast we progress through the material and on your interest. The following list is a rough guide:

- Virtual machines for languages (Java VM, Microsoft CLR, etc.)
- Virtual machines on parallel hardware
- OS-level virtual machines (VMWare Workstation, etc.)
• Architecture support for virtualization
• Virtual machines for embedded systems
• Overlay networks

Course Policy

Grading
The entire course will be graded partially on a curve. I expect the average grade to be around the cutoff between A and B. For this reason, I will deduct points somewhat liberally. Don’t be too upset if you don’t get what you consider to be a high score. When grading on a curve the absolute score is not that important. I will give you feedback on where you are standing in class periodically.

Honesty
I will treat you as professionals, and you should plan on conducting yourself as such. This course presents many important concepts you will need throughout your career as a computing professional, so it is important that each student do all the assignments and projects and learn the material.

You are free to discuss homework assignments and labs with others. However, the solutions you submit are to be developed by yourself. Cheating is a very serious offense and will not be tolerated. Supplying others with material is also against this rule. The policy is that the supplier and receiver of information will both be punished.